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ABSTRACT

The question of how children come to understand how the orthography of English works has been a central issue in reading research for well over 100 years. Reading educators have developed what they believe to be helpful conclusions and explanations for the development of orthographic word knowledge as it relates to reading, writing, and instruction. Their position is that children's invented spelling, or spelling errors, are indicative of their tacit understanding of the alphabetic principles of written language--the knowledge that would be used to spell or recognize a nonsense word. Reading educators have become convinced that a centralized word knowledge is used for both spelling and word recognition. Further, reading educators believe that the development of this word knowledge is consistently stage-like across all children but that the rate and ease of its progression varies with each individual. Finally, reading educators contend that instruction is all important in learning to read, but that it can only affect the ease with which children learn to read rather than the way they learn. Children learn to read with varying degrees of ease and speed depending upon the congruence between what the teacher presents and what the mind requires. (Two figures are included; 34 references are attached.) (RS)

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J. Thomas Gill, Jr.

The Development of Word Knowledge as it Relates to Reading, Spelling, and Instruction

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On gathering Edmund Henderson's notes to prepare this paper I found this introduction:

> Few events have taken me by greater surprise than to learn that not simply the lay public as a whole but the most sophisticated psychologists as well believe that teaching methology makes a real difference. This is to say they believe if you are taught something one way you'll learn one way. If you are taught it another way you learn another way. All I can say is these guys and gals have never been in a classroom, or if they have they've never examined the results. Which is to discover that people who actually practice the exciting business of instruction, i.e. teachers, are not much listened to and respected in those scholarly fields that have to do with learning.

The next paragraph begins and ends "How do you suppose that came about?" For the rest of the story was never completed. While this paper will not attempt to create Edmund Henderson's explanation of how this misunderstanding came to be, it will present the point of view that he and I came to share with a growing number of our students and colleagues.

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The question of how children come to understand how the orthography of English works has been a central issue in reading research for well over a hundred years. Concurrently, reading educators have tried to glean from this research, and from their own experiences, information which could help them help their pupils. Over the past two decades a great deal of light has been shed on this question. During this same period, we have developed what we believe to be helpful conclusions and explanations for the development of orthographic word knowledge as it relates to reading, writing, and instruction.

First, our position is that children's invented spellings, or spelling errors, are indicative of their tacit understanding of the alphabetic principles of written language - the knowledge that would be used to spell or recognize a nonsense word. Also, we have become convinced that a centralized word knowledge is used for both spelling and word recognition. Further, we believe that the development of this word knowledge is consistently stage-like across all children but that the rate and ease of its progression varies with each individual. Finally, we contend that instruction is all important in learning to read, but that it can only affect the ease with which one learns to read rather than the way.

Spelling as Word Theory Reflection

Charles Read's (1971) and Beers and Henderson's (1977) seminal work in invented spelling hypothesized a linguistic explanation for the regular errors in children's spellings. Since then other researchers have confirmed that spelling errors

are not random but are reflections of children's tacit theories. The universality and consistency of the development of a children's spelling theories has been demonstrated in tracing error types across grade and spelling levels (Gentry, 1977; Schlagel, 1982; Templeton, 1983) across normal and learning disabled subjects (Invernizzi and Worthy, 1989), across dialects (Stevers, 1976), across age groups (Viise, 1989), and even across different languages (Gill, C. 1979; Temple, 1978). For example, it has been found that when all beginning readers reach the point where they can voice point accurately in memorized text, their spelling soon reflects the hypothesis that vowels in words are represented according to their proximity in place of articulation to the pronunciation of letter names. Thus "fish" is spelled FES and "bump" is spelled BOP.

Spelling and Word Recognition as Dependent on the Same Word Knowledge

The high correlates found between performance in spelling and word recognition (Juel, Griffith, & Gough, 1976, Zutell, 1975), and between the sophistication of invented spelling and onset of literacy (Morris & Perney, 1989) have suggested that the word knowledge that is reflected in misspellings is the same word knowledge used in word recognition. Ehri's amalgamation theory (1978) presented a explanatory framework wherein the visual image of a written word is included in, or the result of, the cognitive lexical entry for that word. The spelling of a word is amalgamated with its other characteristics such as semantic and syntactic information so that it can be used for any receptive or productive communication tasks. At first she postulated that the

cognitive letter string would need to be complete for each word to allow for immediate recognition and production. However, results of tasks for remembrance of letters in words the subjects had just learned to recognize showed that some letters seemed to have more mental "glue" than others. Barne's (1982) replication of Ehri's word visualization tasks demonstrated the letters remembered more readily to be those which the subjects included in their own spellings of the same words.

Invernizzi (1985) demonstrated that letter clusters which were perceived and recalled as units in word recognition correlated with the subjects' present state of theoretical word knowledge as revealed by their spellings. For example, the ast cluster in "blast" was recalled more frequently than the other possible letter clusters for those subjects who had begun to correctly represent short vowels and mark long vowels with silent letters in their invented spellings. Invernizzi inferred that the movement from a letter name theory of vowel representation to an understanding of correct vowel pattern representation allowed a perceptual shift from letter by letter scanning to perceiving the vowel and what follows, or the "vowel nucleus", as a unit. Thus it was postulated that the internal theoretical word knowledge revealed by children's spellings was that also used in word recognition. Ehri (1980) suggested a way to put this theory to the test:

> In the investigation of hypotheses about printed language and reading acquisition, there is one general strategy available which may prove useful in assessing which aspects of the printed stimulus are important. This involves altering one or another feature of print and comparing its effect upon reading unaltered text. The idea is to determine which printed cues are

> critical to reading by highlighting or obscuring or violating the structure of those cues in print and assessing the impact of this manipulation on reading performance. If the cue is central to processing, the alternation should make a difference. (p.28)

Gill (1989) had first, second, and third graders read words written in their own misspellings and compared their responses to their readings of the same words presented correctly spelled. The critical manipulation was that the printed word stimulus was altered to reflect the exact invented spelling of that word by each individual subject. Thus, each child's recognition response to a standard spelling (e.g. "thief") was compared to his response to the same word presented in his own spelling (THEF). The results indicated that when subjects attempted to read correctly spelled words they were largely depending on those letters which were included in their own spellings, and thereby, accounted for in their present theoretical word knowledge. Stuart and Coltheart (1988) have suggested that one's theoretical word knowledge produces a spelling for each cognitive lexical entry and that this spelling becomes the expectation for that word in print. Gill, however, found a small preference for correct spelling in word recognition tasks. If, in fact, cognitive lexical entries were the exact spellings one would invent, there should have always been a preference for recognizing words spelled in one's own inventories. Therefore, there must be a degree of remembering and storing in the lexical entry some features of written words which have been noticed but not necessarily understood with those that are understood and fixed with more "glue". Ehri (in press) used a rich metaphor in suggesting that the lexical entry used for direct, immediate word

recognition and spelling was built by information, obtained by observing the way words are spelled, traveling along "a visual route paved with phonological knowledge" (p. 7). This phonological knowledge (what we refer to in this paper as theoretical word knowledge) must necessarily be affected by what is seen while at once largely determining what is noticed and remembered. In a field fraught with models, we dare to present another as explanation of how such a thing might work.

Insert Figure 1 about here

Word recognition and spelling seem to result from an interaction of theoretical word knowledge, lexical entries, and attention capacities as these address actual spellings in print. Exposure to print reveals invariant patterns that are underpinned by one's present orthographic theory but which are not yet part of it. This present theoretical word knowledge is then called upon to create an explanation as to how these regularities correspond with one's phonological knowledge. In turn, as a "rule" is derived, the corresponding features are given "glue" in the lexical entry for that word. Reinforcement by exposure to print highlights correct features and sends messages of confirmation to the theory. As these features are then automatized they underpin new awarenesses or present a vantage point from which new invariances can be gleaned. All entries are "wired" to the theoretical word knowledge and to each other.

Thereby, each lexical entry shares a multitude of nodes with all other entries sharing any of the same features. The flow between all three factors - lexical entries, theoretical word knowledge, and observed spellings - is constant in all directions. It is attention which determines the focus. What is perceived or produced is a factor of three things: what is, what is understood, and what has been filed away.

Development of Word Knowledge as Universally Stagelike

This interactive progression would predict spelling and word recognition developing in regular, stage-like fashion as new theories of the workings of words result from consistencies noticed from the hilltop of present word knowledge. This is, in fact, what has been discovered. The character of this development can be, perhaps, best described as "phenotypical" and "genotypical". That is, while there seem to be universal stages, not every child's every spelling exactly reflects the actualization of the present theory. A letter name speller might spell "side" SID but "cake" CAEK simply from more exposure to "cake". Also a child in realizing that his present theory is not correct might throw in perserveration-like features such as a string of o's, u's and l's in many words. Thus, it takes a look across a number of invented spellings to reveal the invariant patterns. Further, the rate and ease with which one moves through the progression varies greatly. Given these precautions, we feel that several major benchmarks note developmental shifts in children's word knowledge.

Realization of an alphabetic principle.

Insert Figure 2 about here

As a child learns his letters, his writing develops from random scribbles to waves to letter-like production to writing actual random letters. Simultaneously his pretending to read voice pointing changes from non unit and non directional to left to right, to attention to printed letters, to attention to written word units. As word units are pointed to, the initial consonant takes on a saliency - it is now the beginning of something. Simultaneously, the realization is made that there is a close relationship between the sound made when one says a word and the sound that one makes when saying the name of its initial consonant (e.g. "James" - "J"), and the child spells accordingly. It is most interesting that the child during this period says a syllable of a memorized verse as he points to each word of its text. This spelling, then, can be seen as a consonantal syllabary. Children at this stage can add the words "put" and "milk" and "James" to their sight vocabularies but will confuse most words that share the same initial consonant.

The fact that his spellings don't agree with the spellings of words he memorizes "by sight" through high frequency, and the fact that his voice pointing on a memorized page of The Pokey Little Puppy leaves him with more words to say after he has run

out of print, tells him that his present theory is not altogether correct. As he uses his knowledge of beginning consonants to self correct his voice pointing, beginning and ending consonants are accounted for theoretically, reflected in his spellings, and used to discriminate "pat" and "pull" in his sight vocabulary. As these features are "firmed up" by confirmation in reading memorized text, and accurate voice pointing is accomplished, word becomes a steady figure with an easily recognizable beginning and end. Given firm, understood boundaries, attention can focus on the middle of the words where vowels are discovered. Vowels are now represented in letter-name fashion in one's spelling; "net" is spelled NAT, "hit" spelled HET, "rot" spelled RIT and "side" spelled SID. However, since this system is not the one that has worked for English since The Great Vowel Shift, children still cannot readily keep "put" and "pat" and "pit" apart. In fact, the only way they can come to do so is by noting the vowel difference.

Understanding of Within Word Patterns.

As a sight vocabulary builds, vowel pattern invariances are necessarily noted and then accounted for in a place of articulation representation shift away from letter name associations and in the understanding of the perceived marking system (silent letters) for actual letter name matches. Children's spellings then reflect a realization of these principles as do their word recognition errors. "Put", "pat", and "pit" are no longer confused and, therefore, the sight vocabulary increases rapidly. Word now is perceived as pattern

instead of letter plus letter plus letter, as Invernizzi's study cited above explains. It is not surprising that this stage of word knowledge marks the advent of fluent reading as the greatly reduced number of eye fixations per word allows exercise of known prosodic features (Bear, 1982). One can also see from this the load that context must carry for the poor speller/word recognizer. One can imagine that the more sophisticated one's word knowledge and the more automatic word recognition, the freer the mind might be to think about "what is going on" not just to be able to recognize the words correctly but to reflect on comprehension's broader reach. It makes sense, then, that Perfetti (1985) found word recognition to be the single most powerful predictor of comprehension.

Understanding Doubling Principles at Syllable Juncture.

When the basic vowel patterns become automatized, an awareness of the doubling principle as it relates to inflectional endings and other syllable junctures begins to evidence itself in children's spellings. (Beers, 1974; Schlagel, 1982) Doubling errors in spelling go hand in hand with lax and tense vowel errors in recognizing words in isolation on a flashed presentation (Weber, 1988). As the various vowel patterns become internalized and the response to them becomes automatic, the doubling principle when adding inflectional endings becomes understood as it does at syllable junctures for words with accented first syllables. As the phonological representations of syllables are understood, spelling errors at syllable junctures for word with unstressed first syllables and vowel errors in unaccented syllables within words of three or more syllables give

evidence of the incompleteness of this theory. This incongruence between theory and how words are actually spelled in print leads the child to look elsewhere for an explanation.

Understanding Derivational Constancies.

As one gains proficiency in reading and understanding material that uses a sophisticated classical vocabulary, morphonemic principles of derivational constancies in the orthographs are realized. Most who reach this phase of reading haven't a clue as to how they correctly spell schwa sounds or silent letters which are morphemic markers. Yet when given a nonsense word such as "rebloat", they will spell "reblotition" with the correct "o" as the schwa while others given "reblete" will spell the identically pronounced "rebletition" with the "e" representing the schwa (Templeton & Scarborough-Franks, 1983). Chomsky and Halle (1968) described the pattern of spelling as one which related to the deep structure of the sound pattern of spoken English rather than to the surface structure. Thus, "derive", "derivative", and "derivation" all retain the steady spelling of the root across the shifts in its pronunciation. Sign/signal, "heal/health", "compete/competition", "compose/composition", "condemn/condemnation" all make perfect sense given this perspective. Templeton (1983) even suggests that it is an awareness of the spelling regularities across the derivatives of words that in many cases allows for the inclusion of these words in one's vocabulary. One need only to compare the number of Indo-European roots to the number of words which share them to realize the potential of the root as a means of

categorizing words. It is obvious, however, that children do not come to realize orthographic derivational constancies until they are competently and easily spelling polysyllabic words phonetically, including a phonologically logical vowel in each syllable. This is necessarily so since it must be the rub between what one's theoretical word knowledge produces and with what one actually notices that forces a reach for a more powerful theory based on a look across exemplars.

The Role of Instruction

The question of the effects of teaching on word knowledge and reading, or word attack, strategy is a slippery one for two reasons. First, the dichotomy between knowledge and strategy seems to be a false one. We see tremendous consistency of strategy across children regardless of materials and/or instruction when their present state of word knowledge is accounted for. It seems that when one knows or hypothesizes certain things about words, the strategy used to recognize them is extremely predictable. In fact, it is word knowledge that delineates the response to words. Therefore, strategy cannot be taught in the absence of pupil knowledge and once that knowledge is there the strategy is quite natural. Second, new knowledge of how the orthography works is always built upon a look outward from the perspective of present knowledge. The progression of this knowledge stays qualitatively the same regardless of method of instruction or materials used.

There are, however, three effects that teacher method may have. First, through artificially controlling exposure a teacher can force what seems to be a leap in word knowledge and/or

strategy in "attacking" and spelling words. For example, Nelson (1989) describes a group of kindergarten children who came to school with little or no alphabet naming knowledge. They were instructed in a strict letter-based program which focused on letter/sound correspondences. For vowels, the focus was on letter/short-sound correspondence. Nelson observed that as these pupils moved from consonantal spelling (BP for "bump") to including vowels, they correctly represented short vowels instead of using the logical letter name substitution. Thus, "bump" was spelled BUP rather than the predicted BOP. While at first glance this seems to evidence skipping the letter name theory/strategy stage, Nelson found evidence that these children were in fact using letter name strategy in that the same children were spelling words containing long vowel sounds with corresponding short vowel letter representations. Thus, "bike" was spelled BOK as /o/ was the closest short vowel sound in place of articulation to the long i. In short, the teachers had presented the children with an alphabetic naming system that had the same relationship between "name" of letter and the sound that occurs in short vowel patterns words that English actually evidenced (and French and Spanish still do) before the Great Vowel Shift. However, the children had used the same developmental strategy found in all normally developing children as they are exposed to more typical instruction. Juel, et al. (1986) reported that beginning readers instructed in basals that contained words of considerable pattern variance developed a logographic strategy to recognize the words while those taught in a basal attending more closely to

redundancies of spelling patterns and phonic instruction developed deciphering reading strategies. However, it seems that children first try to recognize or spell a word immediately by retrieval from the lexicon. What is in the lexicon is a factor of both word knowledge and exposure. Therefore, words and patterns which have occurred more frequently in the child's texts would have a greater chance of being represented more completely in the lexical entry even though some of the features are not presently (or correctly) accounted for by one's present theoretical word knowledge. For example, Groff (1978) found that first and second graders could recall how to correctly spell some one syllable words they had studied even though they consistently made word recognition errors at the medial vowel position. Similarly, Barr (1989), reported that 1st grade children "instructed with eclectic word-based methods" could correctly spell more of the words that had appeared in their basal than they could untaught words which conformed in pattern to the instructed words. However, she found that how completely the subjects spelled their basal words varied according to the length of the word while it did not for the non-basal words. This suggests that the spelling for the basal words was more a reflection of a lexical store built from word knowledge plus rote memory while the spelling of the non basal words was a reflection of one's theoretical word knowledge alone. Barr, in fact, suggested that "knowledge of phonics in conjunction with letter representation in word images (the lexicon stored in memory) influences spelling in a direct fashion". We believe that this reflects the condition of learning about words for all children,

that is, that one's theoretical word knowledge grows from regularities noted in words recalled and that as internalized rules are formed, more glue is given to those corresponding features in the lexicon for existing words and those new ones coming in which share similar patterns. Exposure to words certainly must count in instruction. There must be opportunities to apply one's present present word knowledge to those words and opportunities to look across newly learned words to note new invariances.

Second, the teacher can influence a child's behavior with words by requiring that the child respond to words on a level for which he has no foundation. The example most prevalent in school today is the attempt to teach children about vowels before they have a concept of printed word and its correlate segment of speech. Children, of course, will try to learn what teachers ask them to learn and try to make sense of it. If they cannot, they will resort to memorizing as many of the surface signs of the mysterious competence as they can. Thus, the child without a sense of word can learn to say the sounds of consonants and vowels left to right but is at a loss of how to "blend" and can only come up with the correct word from teacher, text, or other environmental hints. Signs that a teacher has that this is occurring lie in the child's failure to be able to use this vowel "knowledge" in keeping "pit", "pat", and "put" apart in reading; in the failure to correctly represent the vowel correctly in spelling unknown words; and, particularly, in the impossibility for this "knowledge" to become automatized.

Last, a teacher can provide truly helpful instruction by being aware of the universals in the progression of word knowledge and providing the circumstances where the child can firm up his present understandings and use them as the hilltops from which he can glean new invariances and come to understandings about how they work. What kinds of circumstances should be created and how much support is needed are determined by what children have shown us they need. Lots of reading and writing with help when needed have been the necessary and sufficient circumstances and support for many children for many generations.

Recently, we have been formally examining the literary circumstances of those who progress most in reading proficiencies from year to year. We found that when children who scored in the top quartile on the Iowa Reading Test administered throughout Virginia were asked to read from their present basal book, library book, and content area texts, they read with fluency, comprehension, and only made about 2 errors per hundred words in oral reading. Further, we found that they do a lot of reading in these materials. When we tested them on the spelling list that they were going to be taught the following week, they spelled 80% of the words correctly before any study of them. In examining these children's word recognition and spelling errors, we found that the word attack skill or phonic lesson that was coming up for study next represented an awareness that they have already realized.

In contrast, children whose scores fell in the lowest quartile when asked to read from the materials that they were

given in school and that they selected from the library, read haltingly, with little or no comprehension, and made on the average well over 10 errors per hundred words. They scored 20% on the next week's spelling test and demonstrated not only no evidence of any real understanding of the next word skill to be taught but not even the precursors for it. These students have progressed at a rate far below one year literacy growth per year.

However, when we have in our centers and in our field work given children who have been labeled remedial readers many opportunities to read for meaning at a very comfortable level, more opportunity to write abundantly for many honest self-generated purposes, and opportunities to study features of words that their spelling errors show them to be ready for, they too, have made on the average a year's growth in literacy per year.

Our first instructional suggestion then is that their problem is not in what is between their ears but in what is in their hands. We recall Marie Clay saying to us that if a child in Reading Recovery consistently makes more than five errors per hundred words she knows that she has a real remedial case -- a case of a teacher who needs remediation because she is giving the child the wrong book. This basic environment, then, must be the first and most important teacher consideration to circumstance and degree of support. The second consideration has to do with teacher realization of the variance in propensity among children to pick up orthographic invariance naturally. Delores Durkin (1974-75) years ago chronicled children who were able to teach themselves to read without conscious realization of

what was going on. Many in the whole language movement have professed that, like speaking, learning to read is as natural as learning to walk. We believe that for some children this is the case, and for them we need only provide the real materials and purposes for reading and writing. However, most children fall into a larger, second category. For these children learning to read seems to be an unnatural act learned in a natural, progressive way - more analogous to learning to ride a bicycle than learning to walk. Being a language activity, reading must be learned by its practice; but it usually needs direction, support, and instruction. Our basic rule of thumb for these children is to closely monitor their reading to be certain that they are reading a great deal for meaning in material where they are very comfortable. We also encourage a lot of writing for real purposes. We read to children of all reading abilities and ages daily to expose them to more sophisticated vocabulary, syntax, and text structures. We reserve about 25% of our instructional time for word study. The effectiveness of direct word study instruction, appropriately timed to be in accord with one's present word knowledge, has been carefully investigated. Weber and Henderson (1988) gave fourth graders word study tasks which required categorization of known words according to their various vowel patterns for accuracy and speed in addition to the same immersion in instructional level reading and writing as the control group. The experimental group gained significantly in word knowledge as revealed in spelling, word recognition, and fluency not only in the vowel patterns that were studied but also in the doubling principles which knowledge of the vowel patterns

underpin.

There is a third population of children who are as small in number as those at the top end of the scale. These children find it most difficult to glean invariances even from instructional level reading, writing, and word study. Vellutino (1979) has concluded that some of their difficulty lies in language retrieval but that they learn to read in the same way as all other children. If there is something broken with these children, we haven't been able to begin to understand it, much less know how to fix it. Our pedagogical advice is this: don't lie by setting specifically timed goals that are not predictable, and don't give up. The same principles of instruction as outlined above apply to these children. Enrich the child's experience by providing extra reading, writing, and word study and listening experiences on appropriate levels in engaging materials for honest pupil purposes. But, again, know that it will probably take more time.

Assessment for children with any of the varieties of propensity for picking up orthographic patterns should be conducted on the run; that is, as the teacher studies a child's facility in the global task of reading and writing. But it should be done. Reading, writing, and teaching are conservatory arts, not religions. Knowing what vitamins are in cereal can be helpful as long as one realizes that the list on the box is an incomplete reflection of what is gained when one eats. The information can be helpful for supplementing, if needed. Likewise, the teacher need not be wary of the science of the

study of tacit knowledge. We can teach and affect literacy growth positively or negatively by modifying our children's literacy circumstances and the degree of our support. We can either help readers, or we can block their way; but we cannot change the course, nor do we need to. It is not what we teach but when - and the when is revealed by a knowing look at children's productions.

Methods, then, are variations in ways that teachers present material to children. Good ones are as infinite as teachers themselves. Children's minds try to make sense of what is presented. The way that children make sense of the orthography has been demonstrated to be consistent regardless of method of instruction. However, it is obvious that children's understandings are delineated by what they are presented and to what degree they can make sense of it. Therefore, the teacher's role is to present an environment which contains the information that the child needs and the units of information that are congruent with the child's present knowledge and tolerance for variance. We do not call for optimum situations. "Good enough" is better; for if we try to be "optimum" we set up a stressful situation that is too narrowly dependent on our conscious theory of how things work, and we don't allow the child enough mental room to do what children do.

Children do not learn to read one way because they are taught one way while others learn another way because they are taught another way. They will however learn to read with varying degrees of ease and speed depending upon the congruence between what the teacher presents and what the mind requires.

In 1975, in a paper presented at a conference to honor his mentor, Russell Stauffer, Ed Henderson (1975) presented a similar reminder:

> It is now, perhaps, time to recall that written language is man-made stuff, and made for the purpose of being read. Its evolution from simple marks to written language covers, I am told, some thirty thousand years. It would be impossible to suppose that what evolved in this way should be incompatible with the human mind. All written languages must have this quality in common. Moreover, because the human mind has changed but infinitesimally over the centuries, it cannot help but be that all children in a language group will learn to read that language in very much the same way. The proposition that there are phonetic learners and whole-word learners and Ginn learners and American Book learners, is simply inadmissible against the tapestried evidence of human learning. There are certainly an infinite number of ways of interacting with children, some felicitous and some adversive. But there is only one way to learn to read. This is true because children are children, language is language and brains are brains.

In the same presentation he presented a hope for the future:

> Methodology in its brief-lived scientific sense will not simply change, but cease to exist altogether. Children will learn in that one way by which they have always learned; and teaching will hence-foreword consist of helping rather than hindering them from doing so. Pedagogy will become the honest record of our effort to understand the marvels of the language and how children learn it. But from it will be stripped those wistful, half-true programs that preport to replicate the miracle mechanically. Teachers will provide those necessary circumstances of support in the new medium of natural written language until its manner can be assimilated. Rich and varied opportunities will be given to study the way of words; and pupils will have both the opportunity and the responsibility to exercise their minds in the purposeful reconstruction of meaning from the written records of the world. To this great end, science will serve, but not prescribe.

References

Barr, R. (1989). The influence of reading instruction on the spelling of basal and non-basal words. Paper presented at National Reading Council Annual Meeting, Austin, TX.

Barnes, W.G. (1982). The developmental acquisition of silent letters and orthographic images in English spelling. Unpublished doctoral dissertation, University of Virginia, Charlottesville.

Bear, D. (1982). Patterns of oral reading across stages of word knowledge. Unpublished doctoral dissertation, University of Virginia, Charlottesville.

Beers, J. (1974). First and second grade children's developing orthographic concepts of tense and lax vowels. Unpublished doctoral dissertation, University of Virginia, Charlottesville.

Beers, J., & Henderson, E. (1977). A study of developing orthographic concepts among first grade children. Journal of Research in English, 11, 133-148.

Chomsky, N. & Halle, M. (1968). The Sound Pattern of English. New York: Evanston, and London: Harper and Row, 1968.

Durkin, D. (1974-75). A six year study of children who learned to read in school at the age of four. Reading Research Quarterly, 10, 9-61.

Ehri, L. (1980). The development of orthographic images. In U. Frith (Ed.), Cognitive processes in spelling. New York: Academic Press.

Ehri, L. (in press). Reconceptualizing the Development of Sight Word Reading and its Relationship to Recoding in P. Gough (Ed.), Reading Acquisition. Erlbaum.

Gentry, R. (1977). A study of the orthographic strategies of beginning readers. Unpublished doctoral dissertation, University of Virginia, Charlottesville.

Gill, C. (1979). A study of the orthographic strategies of French speaking children. Unpublished doctoral dissertation. University of Virginia, Charlottesville.

Gill, J.T. (1989). The relationship between word recognition and spelling in the primary grades. Reading Psychology, 10(2), 117-135.

Henderson, E.H. (1975). Paper delivered to honor Russell Stauffer. Paper presented at the International Reading Association National Convention, Delaware.

Invernizzi, M. (1985). Visualization and recall of word elements: associations between word recognition and spelling. Unpublished doctoral dissertation, University of Virginia, Charlottesville.

Invernizzi, M. & Worthy, J. (1989). An orthographic-specific comparison of the spelling errors of LD and normal children across four levels of spelling achievement. Reading Psychology, 10(3), 173-188.

Juel, C., Griffith, P., & Gough, P. (1986). Acquisition of literacy: A longitudinal study of children in first and second grade. Journal of Educational Psychology, 78(4), 243-255.

Morris, D. and Perney, J. (1984). Developmental spelling as a predictor of first grade reading achievement. Elementary School Journal, 84(4), 441-457.

Nelson, L. (1989). The influence of phonics instruction on spelling progress. Paper presented at National Reading Council Annual Meeting, Austin, TX.

Perfetti, C.A. (1985). Reading Ability. New York: Oxford University Press.

Read, C. (1971). Preschool children's knowledge of English phonology. Harvard Educational Review, 41, 1-34.

Schlagel, R. (1982). Constancy and change in spelling development. Reading Psychology. 10(3), 207-32.

Schlagel, R. (1982). A qualitative inventory of word knowledge: a developmental study of spelling, grades one through six. Unpublished doctoral dissertation, University of Virginia, Charlottesville.

Stevers, E.F. (1976). Dialectic and socioeconomic factors affecting the spelling strategies of second grade students. Unpublished doctoral dissertation, University of Virginia, Charlottesville.

Stuart, M. & Colheart, M. (1988). Does reading develop in a sequence of stages? Cognition, 30, 139-181.

Temple, C. (1978). An analysis of spelling errors from Gates 1937. Unpublished manuscript, University of Virginia, Charlottesville.

Templeton, S. (1983). Using the spelling/meaning connection to develop word knowledge in older students. Journal of Reading, 27(1), 8-15.

Templeton, S. & Scarborough-Franks, (1985). The spelling's the thing: knowledge of derivational morphology in orthography and phonology among older students. Applied Psycholinguistics, 6, 371-390.

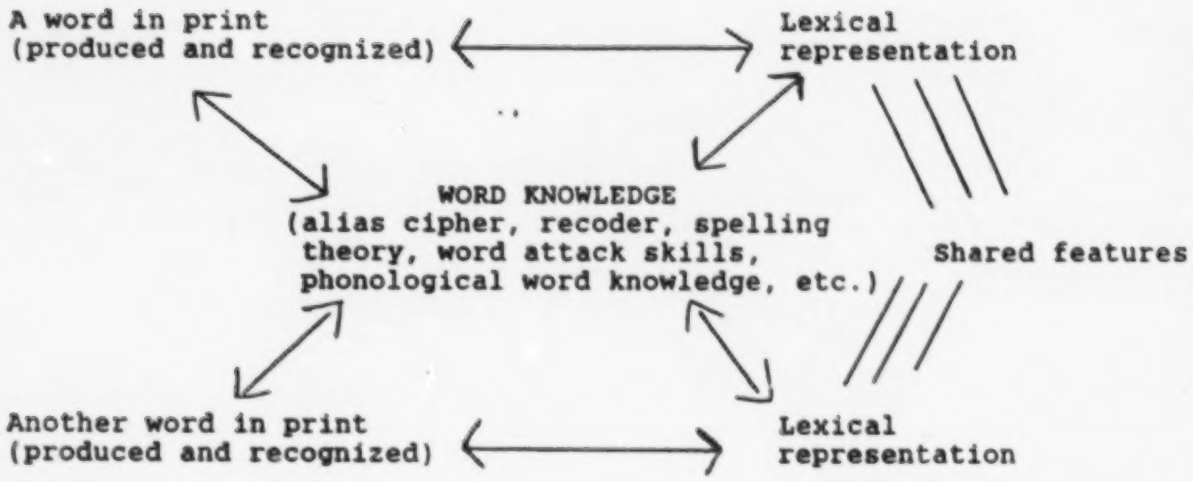
Vellutino, F.R. (1979). Dyslexia: Theory and Research. Cambridge, MA: MIT Press.

Viise, N. (1989). [Adult literacy class: spelling assessments]. Unpublished raw data, University of Virginia, Charlottesville.

Weber, W. & Henderson, E. (1989). A computer based program of word-study: effects on reading and spelling. Reading Psychology, 10(3), 157-172.

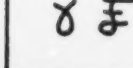
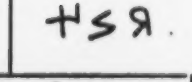
Zutell, J., & Rasinski, T. (1989). Reading and spelling connections in third and fifth grade students. Reading Psychology, 10(2), 137-155.

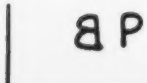
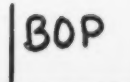
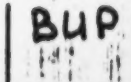
Figure 1


A word in print
(produced and recognized)
Lexical
representation
WORD KNOWLEDGE
(alias cipher, recoder, spelling
theory, word attack skills,
phonological word knowledge, etc.)
Shared features
Another word in print
(produced and recognized)
Lexical
representation

SPELLING

(INTRA-WORD KNOWLEDGE)

No direction	Left to right but no unit	Points to letters says stress units	Points to words says stress units	Points to words says syllables	Self Corrects	Accurate Tracking

SENSE OF WORD

VOICE TO PRINT MATCH

(INTER-WORD KNOWLEDGE)